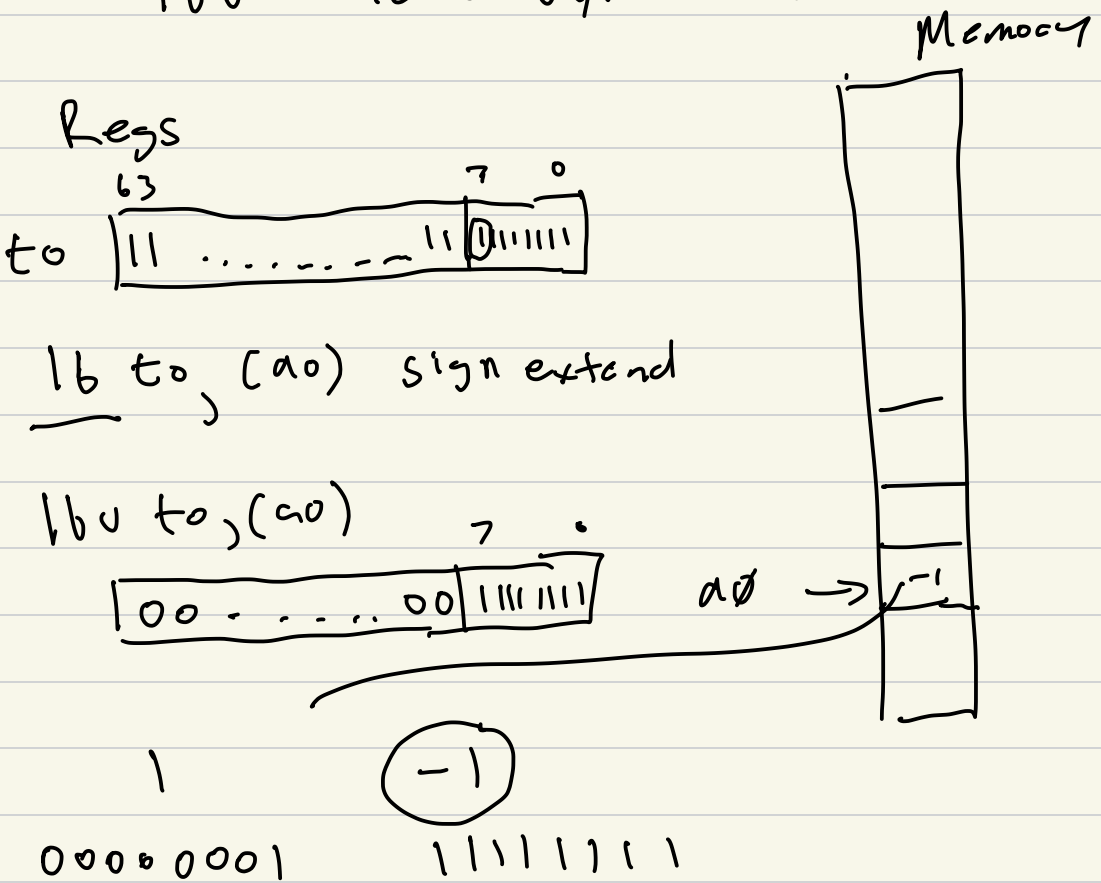
CS315-01 RISC-V Structs Linked Lists

RISC-V Memory Instructions
Loads and Stores

lb load byte
lbu load byte unsigned



char
unsigned char

int8_t
uint8_t

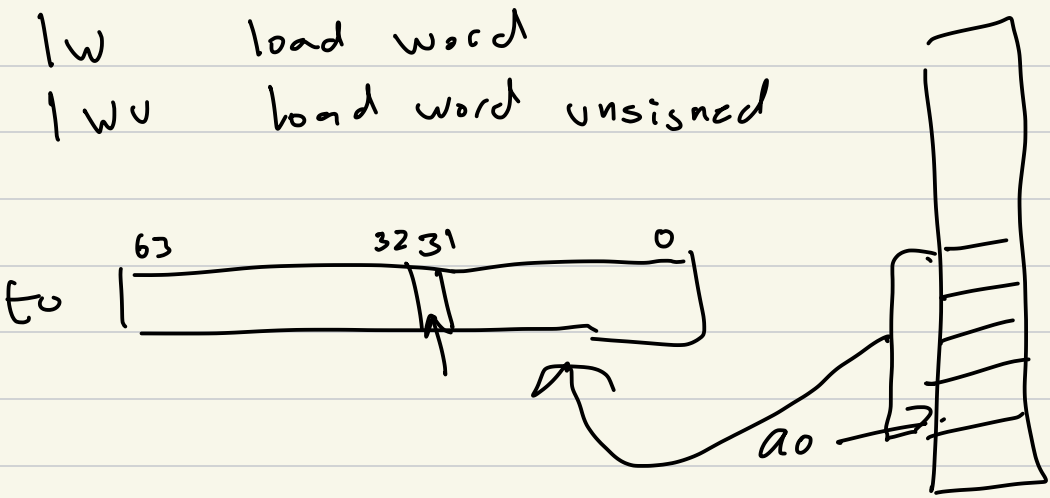
```
struct foo_st {
    char a;
};
```

```
struct foo_st foo;
struct foo_st *fp;
fp = &foo;
fp -> a
```

struct_s:
lb a0, (a0)

---

lw load word
lwu load word unsigned



ld

~~ldu~~ halfword

lh 16 bit int16_t short

lhu uint16_t

Stores

sb , sw , sd

no unsigned versions because they are not needed

Structs lw t0, 8(a0)

C

```
struct foo {
    int a;
    int b;
};
```

ASM

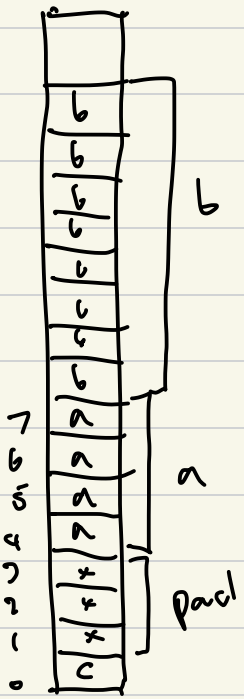
```
# struct foo
#   0  int a
#   4  int b
```

```
struct foo2
    int64_t a;
    int64_t b;
};
```

```
# struct foo
# 0  int a
# 8  int b
```

```
struct foo {
    char c;
    int a;
    int64_t b;
};
```

```
# struct foo
# 0  char c
# 4  int a
# 8  int
```

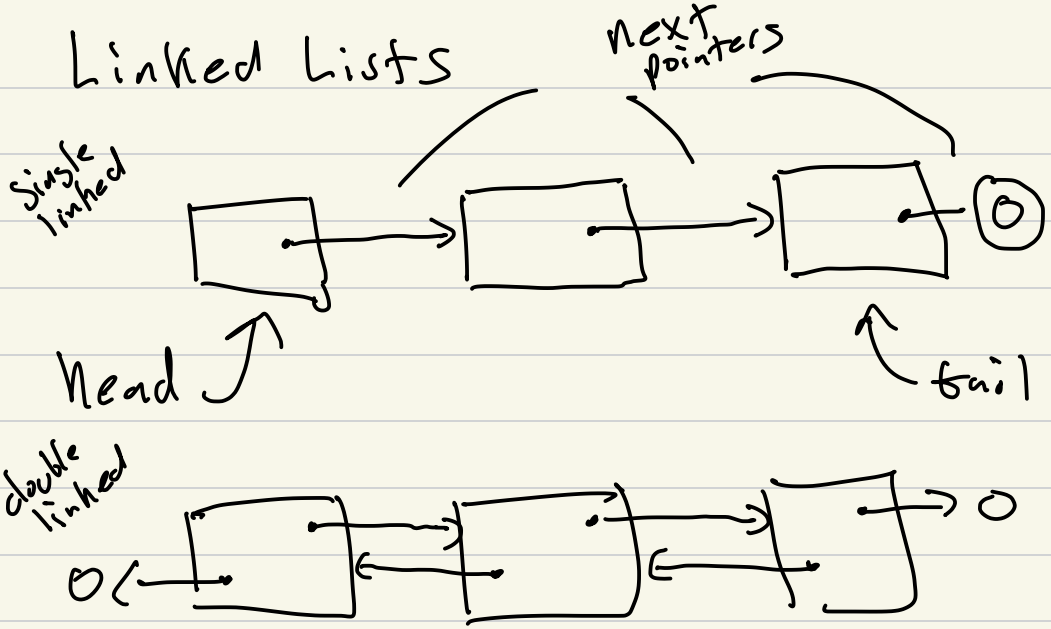


```
struct foo {
    int a;
    char b;
    char c;
    int d;
    char e;
};
```

```
# struct foo
# 0 : int a
# 4 : char b
# 5 : char c
# 8 : int d
# 12 : char e
```

```
struct foo {
    char a;
    int b;
};
```

Linked Lists




```
struct node_st {
        struct node_st *next_p;
        int value;
}

# struct node_st
# 0 : struct node_st *next_p
# 8 : int value
```

all same size

```
int *ip;
char *cp;
struct foo_st *fp;
```

64 bits

8 bytes